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APPLICATION NO. FILING DATE		FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,304 07/29/2003		Alma L. Coats	14974.0002	4474
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STEPTOE &	JOHNSON LLP		HAMILTON	, CYNTHIA
Attn: Docket A	dministrator - Box US	PTO		
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	Washington, DC, 20036		1752	

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)	
	10/628,304	COATS ET AL.	
Office Action Summary	Examiner	Art Unit	
	Cynthia Hamilton	1752	
The MAILING DATE of this communication app	ears on the cover sheet with the c	orrespondence address	
Period for Reply	/ 10 OFT TO EVOIDE • MONTH!	0) OD THIRTY (00) DAY(0	
A SHORTENED STATUTORY PERIOD FOR REPLY WHICHEVER IS LONGER, FROM THE MAILING DA - Extensions of time may be available under the provisions of 37 CFR 1.13 after SIX (6) MONTHS from the mailing date of this communication. - If NO period for reply is specified above, the maximum statutory period of Failure to reply within the set or extended period for reply will, by statute, Any reply received by the Office later than three months after the mailing earned patent term adjustment. See 37 CFR 1.704(b).	ATE OF THIS COMMUNICATION 36(a). In no event, however, may a reply be tim will apply and will expire SIX (6) MONTHS from a cause the application to become ABANDONE	N. nely filed the mailing date of this communication. D (35 U.S.C. § 133).	
Status			
1)⊠ Responsive to communication(s) filed on 2/6/0	6.		
	action is non-final		
3) Since this application is in condition for allowar	nce except for formal matters, pro	secution as to the merits is	
closed in accordance with the practice under E	x parte Quayle, 1935 C.D. 11, 45	53 O.G. 213.	
Disposition of Claims			
4) Claim(s) 1-21,23,24,26-57 and 68-83 is/are pe	nding in the application.		
4a) Of the above claim(s) 9,13,14,23,24,29,32-	55 and 77 is/are withdrawn from	consideration.	
5) Claim(s) is/are allowed.			
6)⊠ Claim(s) <u>1-89</u> is/are rejected.			
7) Claim(s) <u>30-31</u> is/are objected to.	·		
8) Claim(s) <u>1-21,23,24,26-57 and 68-83</u> are subje	ect to restriction and/or election re	equirement.	
Application Papers			
9) ☐ The specification is objected to by the Examine	r.		
10) The drawing(s) filed on is/are: a) acce	epted or b) objected to by the I	Examiner.	
Applicant may not request that any objection to the			
Replacement drawing sheet(s) including the correct	• • • • • • • • • • • • • • • • • • • •		
11) ☐ The oath or declaration is objected to by the Ex	raminer. Note the attached Office	Action or form PTO-152.	
Priority under 35 U.S.C. § 119			
 12) ☐ Acknowledgment is made of a claim for foreign a) ☐ All b) ☐ Some * c) ☐ None of: 1. ☐ Certified copies of the priority documents)-(d) or (f).	
2. Certified copies of the priority documents		on No	
Copies of the certified copies of the prior application from the International Bureau	rity documents have been receive		
* See the attached detailed Office action for a list	of the certified copies not receive	ed.	
Attachment(s)			
1) Notice of References Cited (PTO-892)	4) Interview Summary		
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 	Paper No(s)/Mail D. 5) Notice of Informal F 6) Other:	ate Patent Application (PTO-152)	
S. Patent and Trademark Office			

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DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 6, 2006 has been entered.

2. For clarification purposes the examiner again set forth Example 1 which is the elected species below:

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EXAMPLE 1

[0105] A general purpose resin was prepared with the following components, which are listed both as a % by volume and as a percent by weight:

COMPONENT	% VOLUME	% BY WEIGHT
CN964E75	38.25	37.83
SR494	48	48.74
CN965	10	9.9
SR1135	1.75	1.75
TIN292	2	1.78

[0106] In this regard, it should be noted that CN964E75 and CN965 both contain urethane acrylate oligomers. SR494 is an ethoxylated pentaerythritol tetraacrylate. SR1135 is a photoinitiator and TIN292 is a stabilizer. In particular, CN964E75 includes an aliphatic urethane acrylate (75 to 90% by weight) and ethoxylated trimethylolpropane triacrylate esters (10 to 25% by weight). SR494 is an ethoxylated pentaerythritol tetraacrylate (100% by weight). CN965 is an aliphatic urethane acrylate (100% by weight). SR1135 is a mixture including 2,4,6-trimethylbenzoyldiphenylphosphine oxide, alpha hydroxyketones and benzophenone derivatives and includes 2-hydroxy-2-methyl-1-phenyl-1-propanone (22 to 26% by weight) and 2,4,6trimethylbenzophenone (6 to 7% by weight). TIN292 can be purchased from CIBA, Inc. All of the other components are sold by Sartomer Company, Inc.

[0107] To prepare a general purpose resin, CN964E75 was blended with CN965. To this mixture was added SR 494. To this SR1135 and TIN292 were added. The final weight % of each component is described above in the table.

With respect to instant claim 1, the elected member of the first urethane acrylate oligomer

Markush group is the aliphatic polyester based urethane diacrylate oligomer. The other members

are drawn to non elected urethane acrylates. The elected first acrylate monomer is either the

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ethoxylated trimethylolpropane triacrylate ester or the ethoxylated pentaerythritol tetraacrylate with the remaining one being the second acrylate monomer. Either can be the polymerization modifier. The elected second urethane acrylate oligomer is the aliphatic urethane acrylate called CN 965. The elected photoinitiator is a mixture of 2,4,6-trimethylbenzoyldiphenylphosphine oxide, and an alpha hydroxy ketone of some kind in SR 1135 and 2 hydroxy 2 methyl 1 phenyl 1 propane and 2,4,6-trimethyl benzophenone with the stabilizer being bis (1,2,2,6,6-pentamethyl 4 piperidyl) sebacate which is Tinuvin 292 and also known as a generic hindered amine stabilizer. The examiner notes for the record that applicants on page 11, lines 13-20, or their original specification disclose that the second urethane acrylate oligomer can be the same or different from the first urethane acrylate. Applicants also disclose on the same page that the second acrylate may be the same or different from the first acrylate. This broad scope for these terms is taken into consideration in the following rejections. The examiner notes that applicants require the second urethane acrylate be different in independent claims 1 and 56. No such requirement is made in independent claim 68.

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3. Claims 1-2, 4, 6-8, 10-12, 15-21, 56-57 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (6,420,451) as evidenced by Sartomer Application Bulletin and Sartomer (Low Toxicity...) and Sartomer Technical Data Sheet: CN962 and Sartomer Technical Data Sheet: CN 964. With respect to instant claims 1-2, 4, 6-8, 10-12, 15-21, 56-57 and 83, Lin teaches the mixtures of a first acrylated aliphatic urethane, a second acrylated aliphatic urethane, a nonfunctional acrylate, a second aliphatic urethane in combination with a multifunctional acrylate, a photoinitiator and optionally a light stabilizer and/or a flow additive. See particularly the Abstract, and col. 2. In col. 3, lines 1-10, the first acrylated aliphatic urethanes preferably

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include the difunctional aliphatic acrylated urethanes of CN 962, CN 64, CN 965 and CN 966 and Ebecryl 203 and EBECRYL 230 and 270. The examiner assumed that CN 64 should be CN 964 since this is used in Table 1 with CN 968. No examples of Lin et al make use of the stabilizers but they teach the use of such in col. 4, lines 4-15. Lin et al in Table 1 use all CN 962 and CN 964 and CN 968 for their working Samples. Sample no. 1-5 have mixtures of either CN 964 or CN 962 with CN 968. Sartomer identifies CN 962 as an aliphatic polyester "based" urethane diacrylate oligomer and does the same for CN 964. With respect to the addition of a light stabilizer to the working examples of Lin et al, such is obvious in order to enhance the color of the coating by selecting absorbing radiation. The compositions of Lin et al in TABLE 1 sample no. 1 and 2 teach much of the instant invention wherein CN964 N60 is the first urethane acrylate oligomer CN964 with the monomer SR256 as identified on page 5 of Sartomer Application Bulletin with Sartomer (Low Toxicity...) disclosing on page 3, first column, last partial paragraph that SR-256 is 2,2-(ethoxy ethoxy) ethyl acrylate. The second urethane acrylate is CN 968 and the photoinitiator is methanone, i.e. 1-hydroxycyclohexylphenyl ketone. The second acrylate is HEMA, i.e. hydroxyethyl methacrylate or could be the diacrylate CN968 as for instant claim 10. HEMA could also be the polymerization modifier as could the photoinitiator of Lin et al.

4. Claims 68-69, 71-76, and 78-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ojeda et al (6,326,072). With respect to instant claims 68-69, and 41-76, the compositions of Table 2 from Ojeda et al wherein Darocur 4265 is the polymerization modifier teach species of the instant compositions with the exception of a stabilizer wherein CN 964 is present and is both the first and second urethane acrylate and is disclosed by applicants to be an

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aliphatic polyester urethane diacrylate. In each one as well with the monomers being in Table 1 of Ojeda et al. The Tables from col. 13 and 14 respectively in Ojeda et al are as follows:

TABLE 1			
Acrylate Monomers and Abbreviations			
Acrylate	Abbreviation	_	
Trimethylol propane triacrylate	TMPTA	Τ,	
Ethoxy ethoxy ethyl acrylate	EEEA		
Dipentaerythritol pentaacrylate	DPP		
Ethoxylated trimethylol propane triacrylate	TMPEOTA		
Tripropylene diacrylate	TRPGDA		
Tetrahydrofurfuryl acrylate	THFA		
Cyclohexyl acrylate	CHA		
Tetraethylene diacrylate	TEGDA		
Phenoxy ethyl acrylate	POEA		
Caprolactone acrylate	CLA		
Isobornyl acrylate	IBOA		
Tetrahydrofurfuryl methacrylate	THFMA		
Aliphatic Urethane Acrylate	CN 964		

TMPEOTA is the ethoxylated trimethylol propane triacrylate and both the first acrylate and the second acrylate and at times the polymerization modifier. With respect to the addition of a stabilizer, Ojeda et al in col. 7 staring in line 47 and going to line 46 in col. 8, teach the option of adding a light stabilizer, or ultraviolet antioxidant or free radical scavenger or antioxidant to their compositions, thus with respect to instant claims 68-69, 71-76, and 78-79, the addition of such for stabilization and the other reasons given to any of the compositions set forth would have been prima facie obvious. The compositions of Ojeda et al are not the same as the elected species in that there is no requirement for a second aliphatic urethane acrylate like CN 965 required present nor are there a requirement for ethoxylated pentaerythritol tetraacrylate to be present as the second acrylate.

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		<u>ا</u>	L4		
		TAF	BLE 2		
UV Cui	e Acrylate	Formulations	and Cross H	atch Adhesion	Results
xample	Weight Percent CN 964	Acrylate Monomer	Weight Percent Acrylate Monomer	Weight Percent Darocur ™ 4265	% Polymer Retained sPS
2	80%	TMPTA	20%	1%	0%
3	80%	EEEA	20%	1%	1%
4	80%	DPP	20 <i>%</i>	1%	0%
5	80%	TMPEOTA	20%	1%	0%
6	80%	TRPGDA	20%	1%	0%
7	80%	THFA	20%	1%	1%
8	80%	CHA	20%	1%	0%
9	80%	TEGDA	20%	1%	0%
10	80%	POEA	20%	1%	0%
11	80%	CLA	20%	1%	1%
12	80%	IBOA	20 <i>%</i>	1%	0%
13	80%	THFMA	20%	1%	0%

5. Applicant's arguments filed February 6, 2006 have been fully considered but they are not persuasive. Applicants argue that that the "second urethane acrylate oligomer" of claims 1 and 56 is now required to be "different from the first urethane acrylate oligomer" and that this removes rejections over all the prior art rejections of record. The examiner notes that Lin discloses two such different urethane acrylate oligomers and thus this rejection remains. Applicants present no such arguments with respect to the last independent claim 68. There is no requirement for such a 'difference' in claims 68-76 and 78-82. The rejection stands over these claims for that reason.

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Claims 9, 13-14, 23-24, 29, 32-55 and 77 are withdrawn from further consideration 6. pursuant to 37 CFR 1.142(b), as being drawn to a nonelected specie, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on December 9, 2004. Claims 23 and 77 are drawn to trimethylolpropane triacrylate or pentaerythritol tetraacrylate not their ethoxylated derivatives. Thus, since claims 1 and 68 do not mandate any modifier found in elected species they are non-elected. The examiner is not sure if the use of "the polymerization modifier is selected from the group consisting of" limits the choice of modifier to only those in claim 77. This group does not require that one of the modifiers of claim 68 be used. The closed group meaning of "is selected from the group consisting of" in claim 77 when read in view of claim 68 confuses what is the polymerization modifier of claim 77. Since claim 77 is non-elected, there are no rejections made of claim 77. Applicants' amendment to claim 68 allows the addition of other compounds to the "polymerization modifier" but the wording of claim 77 does not add but instead limits the entire "polymerization modifier" to those put forth in claim 77. To read claim 77 as dependent upon claim 68 requires that the composition of claim 77 have present at least a tris(2hydroxyethyl)isocyanurate triacrylate or isobornyl acrylate. The other members of the closed group of "polymerization modifier" in claim 77 can only be present if in mixture with one of these two compounds of a tris (2-hydroxyethyl) isocyanurate triacrylate or isobornyl acrylate. Neither required member is part of the elected species.

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7. Claims 1-2, 4-10, 18-21, 27-28, 68-69, 71-76, 78 and 80 are rejected under 35

U.S.C. 102(b) as being anticipated by Abel et al (WO 01/98817 A2) as evidenced by Fitz Chem

Corp (PRIPLAST polyester polyols derived from dimerized fatty acids) and Priplast tm 3192 and

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OSHA. With respect to instant claims 1-2, 4-10, 18-21, 27-28, 68-69, 71-76, 78 and 80 Matrix material MM2 anticipated the instant compositions as found on page 25 and reproduced below:

WO 01/98817	PCT/NL01/00465
- 25 -	
Table 5: Matrix composition MM2	
Components of matrix composition MM2	Wt. %
HEA-IPDI-propoxylated(n=4)BPA-IPDI-HEA	A ⁽¹⁾ 17.92
HEA-IPDI-Priplast®3192-IPDI-HEA(2)	29.2
Isobornyl acrylate	29.8
Ethoxylated (n=3) trimethylol propane triac	rylate 1.55
Trimethylol propane triacrylate (TMPTA)	18.5
Lucerin TPO ^{© (3)}	1.5
Irgacure 184 [®]	1.5
Irganox 1010 ^{® (4)}	0.03
propoxylated (n=4)bisphenol A 5 (2) Priplast [®] 3192: dimer acid modified hexa (3) Lucerin TPO [®] : 2,4,6-trimer (supplied by BASF)	thylbenzoyl-diphenyl-phosphine oxide nrityl-tetrakis-(3-(3,5-di-tert-butyl-4-
_10	· • •

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This is the structural formula for IPDI from OSHA:

1.1.4. Physical properties (Ref. 5.2.)

Molecular weight:

222.3

Molecular formula:

C₁₂H₁₅N₂O₂

CAS #:

4098-71-9

Boiling point:

158 #176;C at 10 mm Hg

Helting point:

approx. -60.°C

Density:

0.90 at 20° C

Appearance:

colorless to slightly yellow liquid

Solubility:

completely miscible with esters, ketones, ethers, and

aromatic and aliphatic hydrocarbons.

Synonyms:

IPDI; 5-isocyanato-l-(isocyanato-methyl)-1,3,3

trimethylcyclohexane; isophorone diisocyanate.

Chemical name:

3-isocyanatomethyl-3,5,5-trimetyl

cylcohexylisocyanate

Structure:

$$H_3C$$
 $N = C = 0$
 H_3C $CH_2-N = C = 0$

(consists of two isomers, which elute at different times)

The examiner believes a worker of ordinary skill in the art would understand that BPA references Bisphenol A. Thus, the first urethane of Abel et al, i.e.

HEA-IPDI-propoxylated(n=4)BPA-IPDI-HEA(1)

is an aromatic urethane diacrylate oligomer.

The second urethane of Abel which is

HA-IPDI-Priplast®3192-IPDI-HEA®

is a species of the elected aliphatic polyester diacrylate. Fitz Chem Corp and Priplast tm 3192 identify the nature of Priplast 3192 as a dimer acid-based polyester polyol which has no aromatic group present. Irganox 1010 is held to be inherently a stabilizer. Irgacure is identified by Abel on page 12 as

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follows:

9.

5 component), Irgacure 184 (hydroxy-cyclohexyl phenyl ketone as the active component), Irgacure 907 (2-methyl-I-[4-methylthio)phenyll-2-morpholino propan-

8. Claims 1-10, 18-21, 26-28, 68-76, 78-79 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abel et al (WO 01/98817 A2) as evidenced by Fitz Chem Corp (PRIPLAST polyester polyols derived from dimerized fatty acids), and Priplast tm 3192 and OSHA further in view of Baudin et al (WO 02/48202 A1.). With respect to instant claims 1-10, 18-21, 26-28, 68-76, 78-79 and 80, the composition of MM2 as shown in the preceeding paragraph is taught by Abel and is a species of the claimed instant invention as evidenced by Fitz Chem Corp, Priplast TM 3192 and OSHA with the exception of the use of the word stabilizer and the combination of photoinitiators found in claims 3 and 70. However, with respect to instant claims 1-10, 18-21, 26-28, 68-76, 78-79 and 80, Abel et al teach the optional use of stabilizers on page 15, lines 20-23, and the preferred use of three homolitic photoinitiators as preferred to give a photoinitiator system with differing photosensitivity. These are inclusive of the three compounds found instant claims 3 and 7. The use of such a combination to differ the photosensitivity for the compositions of Abel et al in MM2 would have been prima facie obvious. With respect to what are recognized stabilizers in the optical fiber coating compositions, Baudin et al teach on pages 29-33 such standard additives inclusive of most of the instant stabilizers of instant claims 26 and 79. With respect to instant claims 26 and 79, the use of any of the well know stabilizers in the prior art for optical fiber coatings to be light stabilizers and UV absorbers in the compositions of Abel et al would have been prima facie obvious.

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10. Claims 5 and 72 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 5 and 72 have essentially the same wording which is confusing. Claim 5 will be used here as an example of the problem. The wording of claim 5 is as follows: "The liquid stereolithography resin of claim 2, wherein the photoinitiator includes a component selected from the group consisting of a blend of 2,4,6- trimethylbenzoyl-diphenyl-phosphineoxide and hydroxy-2-methyl-l-phenyl-propan-l-one, a phosphine oxide, a 2-hydroxy-2-methyl-l-phenyl-l-propanone, and mixtures thereof. The examiner is not sure what is required present in the photoinitiator here. Is it a blend of all the compound given? Is it one of the compounds? Are there blends given? Is there one blend then other members of the group? What does "mixture" reference if the entire collection is one "blend"? Thus, the wording of claims 5 and 72 is confusing with respect to what is being claimed as a photoinitiator.

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11. Claims 1-2, 4-6, 10, 18-21, 23-24, 26 and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al (EP 0 874 012 A1). With respect to instant claims 1-2, 4-6, 10, 18-21 and 23-24, Examples 1-6 of Yamazaki et al teach a species the instant invention wherein each Example has two or more different aromatic urethane diacrylate compounds present and isobornyl acrylate present as well as a photoinitiator and other monomers. No clear indication of a stabilizer is found in Examples 1-5 but Yamazaki et al teach the optional use of such in their liquid compositions at the paragraph bridging pates 7 and 8. More stabilizers are listed at the top of page 8 including bis (1,2,2,6,6-pentamethyl-4-piperidylsebacate) as required for instant claim 26. The optional use of polyfunctional compounds inclusive of

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trimethylolpropane trioxyethyl (meth)acrylate as an added monomer to harden the final product as necessary is taught by Yamazaki et al in lines 38-51.

- 12. Claims 1-2, 4, 6, 10, and 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Morris et al (EP 0 745 570 A2). With respect to instant claims 1-2, 4, 6, 10, and 18-21, Examples XII and XIII of Morris et al anticipate the instant composition with respect to aliphatic urethane acrylate, two acrylate monomers with one being multifunctional, a second different aliphatic urethane acrylate and a stabilizer.
- 13. Claims 30-31, and 81-82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The examiner notes for the record that she did not find the elected species with reference to the polyester urethane acrylate specified, the ethoxylated trimethylol triacrylate and the ethoxylated pentaerythritol pentaacrylate and photoinitiator in the prior art. All references added in this rejection are drawn to non elected combinations of compounds within the scope of the generic claims set forth by applicants.
- 14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Hamilton whose telephone number is 571-272-1331. The examiner can normally be reached on Monday through Friday 9:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on (571) 272-0729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 28, 2006

CYNTHIA HAMILTON PRIMARY EXAMINER Cynthia Hamilton Primary Examiner Art Unit 1752